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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional)	
TAZ-240	

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)]	Application Number	Filed
on _____	10/716,729	Nov. 19, 2003
Signature _____	First Named Inventor: Jozef Brcka	
Typed or printed name _____	Art Unit: 1792	Examiner: Rakesh Kumar Dhingra

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

- [ ] applicant/inventor.
- [ ] assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)
- [X] attorney or agent of record. Registration number 25,686
- [ ] attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____

Signature

Joseph R. Jordan
Typed or printed name

513-241-2324
Telephone number

April 25, 2008
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

- [ ] *Total of _____ forms are submitted.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No.:	10/716,729
Filed:	November 19, 2003
Applicant:	Jozef Brcka
Art Unit:	1792
Examiner:	Rakesh Kumar Dhingra
Conf. No.:	6314
Title:	INTEGRATED ELECTROSTATIC INDUCTIVE COUPLING FOR PLASMA PROCESSING
Attorney Docket:	TAZ-240

VIA ELECTRONIC TRANSMISSION
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Applicant requests review of the Final Rejection dated December 26, 2007. No amendments are filed herewith. This Request is being filed concurrently with a Notice of Appeal.

REMARKS/ARGUMENTS FOR REVIEW

Review of claims 4, 6 and 9 is requested.

Following the Final Rejection, Applicant filed an amendment re-writing dependent claims 4, 6 and 9 in independent form and canceling all other claims, thereby simplifying the issues and placing the application in better condition for appeal.

The Examiner has not yet acted on the amendment.

The Invention

The application addresses a problem found in the processing of large area semiconductor wafers with a high-density, inductively-coupled plasma: the tendency of the plasma density to be higher at the center than at the edge of the wafer, which causes non-uniform wafer processing. Applicant's novel solution is to position a peripheral ionization source (coil) around the perimeter and in the plane of a wafer support, to capacitively couple the coil to the support, and to connect the capacitively coupled coil and support in a series RF circuit. As such, the plasma is energized by capacitive coupling of RF energy from the support at the center and by inductive coupling of RF energy from the coil at the perimeter. A Faraday shield covers the coil to prevent capacitive coupling from the potential that develops across the coil. All of the emphasized features are recited in claims 4, 6 and 9.

The Rejection

Claims 4, 6 and 9 are rejected based on combinations of 4, 5 and 4 references, respectively. Each claim is rejected under 35 U.S.C. §103(a) as being unpatentable over Tanaka, et al. U.S. Patent No. 6,210,539 (*Tanaka*) in view of Usui U.S. Patent No. 5,513,765 (*Usui*) and Khater et al. U.S. Patent No. 6,459,066 (*Khater*) and, in addition:

Claim 4 is rejected over *Tanaka* in view of *Usui* and *Khater* and further in view of Roderick U.S. Patent No. 6,353,206 (*Roderick*);

Claim 6 is rejected over *Tanaka* in view of *Usui* and *Khater* and further in view of Moslehi et al. U.S. Patent No. 6,471,830 (*Moslehi*) and Denda U.S. Patent No. 6,440,660 (*Denda*); and

Claim 9 is rejected over *Tanaka* in view of *Usui* and *Khater* and further in view of *Moslehi*.

The primary reference, *Tanaka*, discloses a coil around the perimeter of a wafer support. The coil and wafer support are, however, in two separate circuits: the coil is connected across an RF generator to energize an inductively coupled plasma, and the wafer support is connected in a separate

AC or RF bias circuit to control the flux of ions from the plasma. To address the same problem addressed by Applicant, the coil is moveable up and down to a position that yields the most uniform plasma, typically slightly below the plane of the wafer support.

The *Usui* reference discloses a coil around the outside of a chamber connected in series with a wafer support inside of the chamber.

The *Khater* reference discloses Faraday shield for a coil used to inductively couple a plasma.

The *Roderick* reference and the *Moslehi* reference each disclose a coil that is capacitively coupled to a generator, but neither discloses capacitive coupling of the coil to a wafer support in series circuit that couples RF energy to a plasma.

The *Denda* reference is cited for matching network details.

The Issue

The issue is whether the Final Rejection of December 26, 2007, satisfies the minimum requirements of MPEP §706.02.

Argument

There are two issues appropriate for Pre-Appeal Brief Review, either of which can result in allowance of claims 4, 6 and 9.

1. Claims 4, 6 and 9 (see Amendment After Final filed April 23, 2008) each recite an RF series circuit that includes a peripheral ionization source *capacitively-coupled to* a substrate support surface. No reference discloses this feature. *Roderick* and *Moslehi* capacitively couple a power supply and matching network to a coil, but not a coil to a substrate support. Applicant's claimed feature makes possible an integrated device in which the substrate support can serve as an electrostatic chuck and be biased separate from the coil using a single RF power supply that also energizes the plasma. Accordingly, the rejection fails to make a *prima face* case for the obviousness of these claims. Accordingly, claims 4, 6 and 9 should be allowed.

2. No reference expressly teaches the capacitively connecting of *Tanaka's* coil in an RF series circuit with his substrate support. Every rejection is based on an unsupported statement by the Examiner alone that it would be obvious to employ *Usui*'s circuit, in which his coil is connected in series with his substrate support, in the apparatus of *Tanaka*, citing, as motivation, the universal desire to maintain plasma uniformity. It is true that both *Usui* and *Tanaka* each employ their respective designs with the intent of achieving some necessary level of plasma uniformity. But everyone skilled in this art would easily recognize that taking any two machines that are optimized to achieve some degree of plasma uniformity, and exchanging parts between those machines, would make both machines worse, unlikely to improve uniformity, and unpredictable. The Examiner's unsupported statement that a desire to achieve plasma uniformity would somehow motivate one skilled in the art to exchange features between two machines is erroneous. Some objective evidence to support such a statement is needed. None will be found, since the statement is not true. Accordingly, it is submitted that the evidence is insufficient to support the Examiner's conclusion that connecting *Tanaka*'s coil and substrate support in series is obvious. Furthermore, the substrate support and coil in *Usui*'s series circuit are not capacitively coupled, but are instead hard-wired. Accordingly, it is submitted that claims 4, 6 and 9 should be allowed.

Respectfully submitted,

WOOD, HERRON & EVANS, L.L.P.

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